

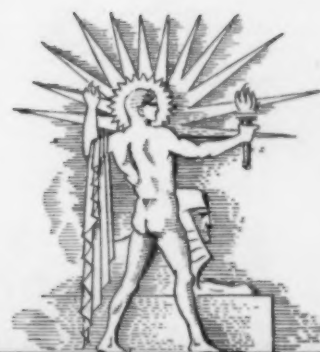
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SCIENCE NEWS LETTER

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THE WEEKLY SUMMARY OF CURRENT SCIENCE •



DECEMBER 20, 1930

Festooning the Evergreen Tree

See Page 392

A

SCIENCE SERVICE PUBLICATION

SCIENCE NEWS LETTER

Vol. XVIII

No. 506

The Weekly
Summary of  Current
Science

Published by

SCIENCE SERVICE

The Institution for the Popularization of Science organized under the auspices of the National Academy of Sciences, the National Research Council and the American Association for the Advancement of Science.

Edited by WATSON DAVIS

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DO YOU KNOW THAT

The entire country of Norway reported only one murder within its borders in 1928.

The language spoken by the ancient Egyptians was in use as late as the seventeenth century A. D., and is still used in Coptic church ritual.

Bees produce honey from material that would otherwise be of no use, and thereby add \$25,000,000 to America's income, a Cornell University farm specialist points out.

Cream cheese made by a new process at a New York State agricultural experiment station has been shipped across country, six days in the mail without refrigeration during warm weather, and arrived in good condition.

The wild boar has become extinct in Egypt only in the past century.

The batfish of tropic seas knows how to swim but generally hops along at the bottom of the sea on four feet, says a curator at the Field Museum where one of these fish is on exhibit.

A commission is studying the possibility of building a highway to connect the northwest United States with British Columbia, Yukon Territory, and Alaska.

Turkey, which is going in intensively for silk raising, produced four million pounds of cocoons last year.

Rubber is coming into use as a protective coating on aluminum alloys in aircraft manufacture to prevent corrosion.

Canada, renowned for its fur trade, is now surpassed by Louisiana in the number of pelts produced.

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MAKING THE STARS STAND STILL

By James Stokley, associate director of the Franklin Institute Museum, who will have charge of the Museum's astronomical section, including the second Zeiss planetarium in the Western Hemisphere

Friday, December 26, 1930, at 3:45 P. M., Eastern Standard Time

Over Stations of

The Columbia Broadcasting System

ASTRONOMY

Dr. Hubble Finds Galaxies Evenly Scattered in Space

Each of 30 Million is Similar to Milky Way System Which Comprises All Stars That Can be Seen

AS FAR as the largest present-day telescope can reach into space—a distance of 300 million times the six trillion miles that light will travel in a year—there are uniformly scattered a total of 30 million island galaxies. Each of these is a system of stars similar to the Milky Way system, of which the Sun, and all the other stars that we can see, are part. Further, the space between them is perfectly transparent, at least as nearly as we can judge.

In a report to the Carnegie Institution of Washington, Dr. Edwin P. Hubble, of the Mt. Wilson Observatory, told of his latest researches in studying these objects, the most distant observed by astronomers.

On the average, he has found, the distance between neighboring nebulae or galaxies, is about $1\frac{1}{2}$ million light years. Many of them are arranged into clusters, but, if large volumes are considered, their distribution is uniform. This was learned by a study of photographs made with three different telescopes, including the Mt. Wilson 100-inch, the world's largest. With so many objects, they may all be assumed to be of the same brightness, and the photographs showed that when nebulae four times as faint were recorded, there were eight times as many. As the faintness of a nebula varies not with the distance directly, but with its square, one that is four times as faint as another must be at twice the distance. Therefore, the number of nebulae vary with the cube of the distance, and this means that they are uniformly distributed.

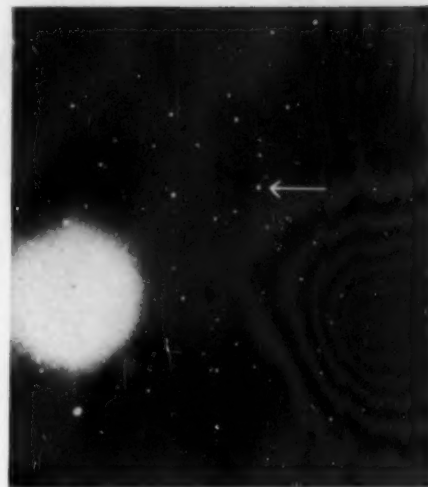
Dr. Hubble also considered the question of what is beyond the observable region. Of course, larger telescopes, such as the 200-inch now under construction at Pasadena, will reach still farther, but does the uniform distribution of galaxies hold indefinitely?

"There is no evidence of a thinning out, no trace of a physical boundary," he said. "The universe, we must suppose, stretches out beyond the frontiers, and for a while, at least, the unknown regions are probably much like the

known. This is a legitimate extrapolation, but it cannot be pushed indefinitely. An infinite homogeneous universe is not compatible with the observed darkness of the sky and the stability of the stellar systems. Yet, if the universe is not homogeneous, then the observable region is not a fair sample and extrapolations lose their significance."

This dilemma, he explained, can be escaped by means of the theory of relativity, which assumes a closed universe with a finite volume, but no boundaries, something like the surface of a sphere. This fits in, he explained, with the apparent high velocities observed for some of the more distant galaxies. One cluster, in the bowl of the Great Dipper, is at a distance of 75 million light years, and seems to be receding at a speed of more than 7,000 miles a second.

This apparent speed can now be used to measure nebular distances, but Dr. Hubble expressed the view that it is not a real speed. Instead, it is probably a consequence of the curvature of space, in some other than our familiar three



THE LITTLE DOT

Indicated by the arrow is a galaxy of the Ursa Major cluster and is made up of thousands of stars. It is the most distant galaxy ever measured, having been found by Dr. Hubble to be 75 million light years from the Earth. Even when looking through the world's largest telescopes, the eye cannot see this galaxy; it is revealed only by photographic plates after many hours' exposure. The large bright spot is a nearby star, much brighter than the galaxy but equally fainter than the stars we see in the night sky.

dimensions. As an analogy, Dr. Hubble mentioned a map, in two dimensions, of the curved surface of the Earth. If a small area is represented, the flat map differs little from the curved Earth, and it is fairly accurate. But if the whole Earth is represented, the parts away from the center of the map are greatly distorted.

Science News Letter, December 20, 1930

METEOROLOGY

New Weather Stations Map Asiatic Air Currents

THE four meteorological stations which the Sven Hedin Asiatic expedition established in the interior of Asia are being operated now by Chinese scientists.

These stations, the only ones of their kind in an area as great as the continent of Australia, are gathering much information about the exchange of air currents between the polar regions and the equator, according to word received in Peiping.

Three years ago, Dr. Hedin established the stations, and meteorologists of his expedition started the work of

sending up balloons filled with hydrogen gas, which were watched by telescopes. By this method, the air currents are being charted. Chinese students who accompanied the expedition were taught the method and last year Dr. Hedin presented the stations, fully equipped, to the Chinese government.

Apart from the general scientific value of the weather data, it is hoped that the work will prove of definite practical value to China by making it possible to predict storms coming from the Northwest.

Science News Letter, December 20, 1930

PSYCHOLOGY

Uncle Sam Tells Santa Claus Latest Facts About Toys

Action and Initiative Toys, Non-Breakable Toys and Out-Door Toys Urged by U. S. Children's Bureau

TIMES have changed since Santa Claus first opened shop. So to prevent the veteran toy dispenser from falling into any old-fashioned errors, Uncle Sam this year is volunteering the latest scientific advice concerning playthings suited to the needs of American boys and girls.

Don't give children toys that make them lookers-on, is the first law laid down by recreation experts of the U. S. Children's Bureau of the Department of Labor.

"The little child is interested in making, in building, in doing—not in looking on. If he does not develop this interest early in life he may grow into the kind of person who is always a looker-on," warns a forthcoming edition of *Child Care*, in which Uncle Sam describes the approved modern method of rearing future citizens.

Men and women who can do things are necessary to the greatness of a country. Hence the government is interested in seeing constructive toys in the nurseries and yards where the men and women of tomorrow are playing.

"Blocks should be part of the equipment of every play room," continues the discussion. "Plain blocks, colored blocks, large ones and small—all blocks are worth-while toys. They are used in many ways—to build houses, barns, fences or roads. They become trucks and railroad trains. The colored ones that offer a change to experiment with patterns, shapes, and matching of colors delight children. Wooden blocks in the shape of a train of cars which can be taken apart or hitched together easily are good."

Balls, large and small, clay, paper and crayons, carpentry and gardening toys are other playthings which encourage initiative and are consequently in high favor with the child experts. For the young child, toys that can be pulled by a string are recommended, while dolls and toy animals have official approval.

Easily breakable toys fall under the stamp of government disapproval, however. Through smashing his playthings,

the child learns careless, extravagant ways, say the experts. Toys should encourage constructive, not destructive habits, they maintain.

Pastimes that are unduly confining or which strain the attention of the young child should also be avoided. When they stiched away at samplers, the little ladies of our grandmother's generation were inviting nervous ailments for their old age, psychologists today are convinced.

Toys that take the child outdoors into the fresh air and encourage him to vigorous play are desirable, on the other hand. Tricycles, wheelbarrows, sleds, and wagons big enough to ride in belong to this class of toy.

Boys Should Like Dolls

It is just as natural for small boys to like dolls as it is for fathers to be fond of their children, observation of the toy preferences of young children has convinced Miss Ella Gardner of the Recreation Division of the Children's Bureau.

When sonny howls for his sister's



BECOMING A MAN OF ACTION

The U. S. Children's Bureau advises against Santa's bringing toys that make the children on-lookers only. This youngster is beginning early his development into a man with initiative

doll, therefore, his fond parents are not to feel disgraced. And most particularly, they are not frantically to try to crush these unexpected signs of tenderness on the part of the young male by ridicule or punishment.

Far from being a warning of future sissiness, the boy's concern for a doll is probably a first expression of the protective instinct and is a characteristic of the strong defending the weak.

Science News Letter, December 20, 1930

BOTANY

Pioneer Plants Grow On Sterile Volcanic Ash

HUMBLE but hardy plants able to grow in a soil utterly without the all-necessary nitrogen salts are described by Prof. Robert F. Griggs of George Washington University, who has just returned from a botanical expedition to the famous Katmai volcanic region of Alaska.

When Katmai exploded, about twenty years ago, it devastated a great area of country, covering it with raw, naked volcanic ash. How plants could gain a root-hold on this new desert, devoid as it was of some of the indispensable elements for plant life, was a question that interested botanists very much.

The plants have been answering. The pioneers have been liverworts, which are a group of green creatures related to the common mosses, but a step farther down the evolutionary ladder. Though the soil they grow on contains no nitrogen the plants' bodies themselves have it. It must therefore be assumed either that the liverworts themselves capture this element from the air or that some microscopic plant or animal associated with them does it for them, just as the nodule bacteria capture nitrogen for the clovers. Prof. Griggs will endeavor to find an answer to this question.

Science News Letter, December 20, 1930

PSYCHOLOGY-HIGHWAY SAFETY

Majority of Accidents Happen to a Few Susceptibles

But Report Before Highway Research Board Shows That Instruction Will Correct Nearly all Accident-Prone Drivers

SOME people have more than their share of accidents because they are especially susceptible. The causes of many of these accidents can be found, and by instruction in safety the accident-prone drivers can often be made even better than the average risk.

Thus is summarized a portion of the annual report of the Committee on Highway Traffic of the National Research Council's Highway Research Board presented in Washington last week at the annual meeting of the Board. It represents a review of the conclusion of recent accident studies carried out in different parts of the country and was prepared by Sidney J. Williams, director of the public safety division of the National Safety Council.

Inadvertency, or the lack of sufficient will or desire to prevent the accident, was said by Mr. Williams to be the most important of the causes which result from human failure. By inadvertency is meant recklessness, intoxication, pre-occupation, excitability and temporary distraction. Other causes were said to be ignorance, meaning lack of knowledge or skill, and physical and mental deficiencies.

To prevent accidents among the general public the report suggested that special study be made of drivers whom records reveal as accident-prone. Licenses would not be revoked until it is clearly shown that instruction in safety is of no value and that the party is one of "a certain percentage of the population, probably extremely small, that cannot possibly be made into safe drivers."

Measures Highway Capacity

How many automobiles can travel on a highway without congestion?

Dr. A. N. Johnson, dean of engineering of the University of Maryland and member of the Highway Traffic Committee, has answered this question. In his report he said:

"The two-lane road is practically free from congestion up to 1,000 vehicles per hour. The three-lane road is practically free up to 1,600 vehicles and is

congested not to exceed one-fifth of the time up to 1,900.

"With further increases in the number of vehicles per hour, congestion increases at a more rapid rate on a two-lane than on a three-lane road. When four-fifths or more of the traffic is in one direction, the two-lane road is practically free from congestion up to 1,300 vehicles and the three-lane road up to 2,300."

Observations were also made on a four-lane road but there was not enough traffic to cause congestion, the greatest rate of passing being 3,228 vehicles per hour. In making the observations congestion was said to occur, Dr. Johnson explained, when a reduction of speed was noticed and the drivers began to crowd each other.

He insisted that the results are not conclusive because of the few observations made, but that they "do disclose a general indication that must be close to the facts."

Raising a Road By Boot Straps

Slabs of concrete which settle and sink below the road level in Iowa are

being "raised by their boot straps." This new method is proving more effective and more economical for leveling the sunken parts of concrete highways than processes previously used by engineers. It was invented and patented by John Poulter, a mechanic of the Iowa Highway Commission. Its applications were described by W. H. Root, an engineer of the Commission.

By Poulter's process a mixture of mud and cement is pumped beneath the concrete through holes drilled in its surface. This mud mixture spreads out between the concrete and the ground, forcing the concrete up to make room for itself. It later hardens in place. More than 50 settled portions of road in Iowa have been raised by this method, in some places as high as 13 inches.

The chief advantage of this method, Mr. Root pointed out, is that it is cheap and it cures the settlement at the source of trouble by filling the voids underneath the pavement.

Science News Letter, December 20, 1930

CONSERVATION

Reasonable Tree Cutting Urged for Christmas

THE Christmas tree, center of the Yuletide celebration ever since our half-barbaric forefathers feasted in the forests of Germany, threatened as the result of present-day need for conservation of timber, has received a new lease of life.

Within reason, says the U. S. Forest Service, Christmas trees may be used



CONCRETE ROAD "RAISED BY ITS BOOT STRAPS"

A mixture of mud and cement is being pumped beneath the concrete through holes driven in its surface in order to raise sunken slabs. This new method was reported to the Highway Research Board of the National Research Council

without danger to America's chances for recovery of her vanishing forests. Indeed, the use of Christmas trees may even aid in that recovery.

For in man-helped forests as in naturally propagated ones, many more young trees must be started than ever have a chance to grow to full maturity. A few years after a burn or a landslide, the swept area may be thick with saplings "like hair on a dog's back." And foresters imitate more or less this thick-planting tendency of nature.

But as the little trees grow up they all demand room to spread their branches, and if they are all left stand-

ing they will push and elbow each other most unmannerly. A stand of saplings left unthinned will grow up into a weed-patch instead of useful timber, full of slim, spindling trees whose trunks might be good for fishing poles but not for much else.

So the foresters have to go in and select the young trees that are to be the timber, and ruthlessly cut out all others. Hundreds of thousands of young evergreens are thus eliminated every year. They used to be heaped up and burned to get rid of them.

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BIOLOGY

Reports of Artificial Life Viewed With Skepticism

Many Experiments Apparently Successful in Giving Life To the Non-Living Have Come to Naught

ARTHIFICIAL life, made out of non-living stuff in the laboratory, is a dream as old as the alchemists' ambition to make gold out of lead. For this reason scientists view with interest, tempered with intellectual skepticism, the newspaper reports that have credited Dr. George W. Crile, Cleveland surgeon, with boosting the non-living across the line into the land of the living.

Many have been the apparent successes of the same experiment in the past. One of the most promising-looking and at the same time the most sensational of these efforts to make life in a test-tube was that of H. C. Bastian, who in 1911 put various non-living constituents in glass tubes, sealed them up, heated them to a point where no living thing could survive, and then let them stand in diffuse sunlight for several months. Gradually little particles of jelly-like stuff appeared in the tubes, some of them looking like fungi, some like yeasts, some like minute bacteria. These absorbed certain dyes in the same way that their "natural" models absorb them, and also reproduced themselves when fed on suitable substances. But they were only a nine-days' wonder to the public; only scientists remember them now.

More recently a pair of noted physiologists, Dr. D. T. MacDougal and Dr. Vladimir Moravsek, made an artificial cell, not claiming that it was alive. They

merely impregnated a paper thimble with a vegetable jelly, coated it with another vegetable substance found on the outside of cells, and lined it with a jelly containing some of the constituents of living protoplasm.

When immersed in water or solutions of various chemical salts, this artificial cell, non-living though it avowedly was, displayed many of the characteristics of life. It enabled its inventors to get a new insight into some of the mechanics of real cells, which was what they were after. As such it was a good laboratory tool. But it did not contain the "secret of life."

About a quarter of a century ago there was a great deal of excitement over the supposed "creation of life" by the noted physiologist Dr. Jacques Loeb. It annoyed him very much, for he had not created life. He had done a notable thing, however; he had caused unfertilized eggs to begin developing without adding any sperm or male element, simply by treating them with chemicals, pricking them with fine needles, and otherwise stimulating them.

Since that time many other scientists have repeated this work with variations. One has produced young sea-worms with no other father than an electric current. Another brought little frogs into the world that were half-orphans from birth, unless one is willing to call a steel needle their sire. But all these

experiments start with living eggs. They in no way create life. They merely stimulate life that is already existing but dormant in the unfertilized egg.

The problem of the origin of life on earth has been so baffling that some scientists and philosophers have "passed the buck" by postulating the drifting of a few living germs through space from another planet. Prof. Svante Arrhenius, famous chemist, subscribed to this view before his death. But the difficulties of such a transfer are almost insuperable. The intense cold of outer space, the tendency of some of the necessary elements, notably oxygen, to diffuse out of the drifting germs, and the unimaginably long years of drifting that would be needed, if the matter were left entirely to chance, together with other obstacles, pile up a barrier too high for the imagination of most scientists to surmount. Besides, even if life did come here from somewhere else, the question would still stand: how did it get where it came from in the first place?

Most scientists prefer to believe that life originated here on our own planet, although with Darwin they do not profess to have any positive knowledge of how it came about.

Science News Letter, December 20, 1930

ANIMAL HUSBANDRY

Better Animals Stocking Farms of America

BETTER and healthier farm animals are stocking American farms at the end of 1930 than ever before in history, the annual report of Dr. John R. Mohler, chief of the Bureau of Animal Industry of the U. S. Department of Agriculture, indicates.

This progress is attributed to the increasing use of purebred sires and the activities of breeders who are supplying improved types of animals in sections where the diseased and unthrifty stock are being condemned and culled. The bureau has contributed to this improvement through its activities in combating stock diseases, whose control has encouraged farmers to invest in better stock.

"The steady progress of tick eradication in the South is an important factor in the demand for well-bred cattle. Better health among farm animals is revealed by the rapid eradication of tuberculosis, the lowest prevalence of hog cholera in many years and improved methods of combating many other maladies," the report states.

Science News Letter, December 20, 1930

ANATOMY

A Bone Man And a Muscle Man

As Dissected by Vesalius,
Pioneer in Accurate Anatomy

"A Classic of Science"

*Librorum Andreae Vesalii, Bruzellen-
sis, De Humani Corporis Fabrica, Epi-
tome cum Annotationibus Nicolai Fon-
tani, Amstelodami, MDCXLII.*

VESALIUS' EPITOME first appeared in Basel in 1540, and was reprinted many times as a standard text in the new science of anatomy, just emerging from the fetters of Galen's authority. It and the fuller Fabrica, published three years later, were illustrated by artists who were pupils of Titian. They served as models of anatomical charts for more than a century. Vesalius obtained his material for dissection from the public gibbets where thieves were hanged. Garrison says: "It was the effect of his strong and engaging personality that made dissecting not only viable, but respectable."

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ASTRONOMY

Astronomers Find Pluto As Massive As Earth

THE planet Pluto, most distant known member of the Solar System, is of approximately the same mass as the Earth. Dr. Seth B. Nicholson and Nicholas U. Mayall, of the Mt. Wilson Observatory, have ascertained this fact by studying the way that Neptune, second most distant planet, is pulled out of its proper path by the Plutonian attraction. It was by a method similar to this that Neptune itself was discovered from its effect on the motion of Uranus.

Pluto was discovered last spring by astronomers at the Lowell Observatory in Arizona, but it turned out to be much fainter than had been expected. The new work shows that it is more similar to the inner, or minor, planets, Mercury, Venus, Earth and Mars, than to its nearer neighbors, the major planets, Jupiter, Saturn, Uranus and Neptune. According to Dr. Nicholson's figures, Pluto is now about three and a half billion miles from the earth, but it is gradually coming a little closer.

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FORESTRY

Holly Can Send Today's Babies to College

IF YOU have a baby who is going to college some day, and also some cut-over woodland that isn't good for farming, the planting of a crop of holly now may provide a good slice of the necessary school expenses sixteen or eighteen years hence.

Holly is a profitable crop, and is going to be more profitable, in the opinion of P. L. Ricker of the Wild Flower Preservation Society. Our native American holly, once abundant from Florida to Cape Cod, is now hardly to be found north of the New Jersey line, thanks to the unrestricted depredations of commercial holly gatherers. In their eagerness to realize a cash return now they have been sacrificing the next generation's Christmas decorations, and there is not much prospect of any effective check on their operations until they themselves have killed their goose that lays golden eggs.

The foresighted owner of waste land in any region where holly grows naturally can take advantage of the shortage that is sure to come by planting holly now. It takes about eighteen years for a holly plantation to come into best bearing, but after that, with decently

conservative cutting, it will be good indefinitely.

The best method of propagating holly, Mr. Ricker says, is by cuttings. They should always be made from the best berry-producing trees. Production from seeds is hardly practicable, for holly seeds are uncertain and slow to germinate, produce only about ten per cent. of female, or berry-bearing plants, and even these are of uncertain productivity. Cuttings insure a continuance of the same qualities in the offspring that are found in the parent tree.

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ICHTHYOLOGY

Fish That Hates Water Lives On Australian Reef

A FISH that seems to dislike getting wet is the exceedingly curious creature described by an Australian zoologist, Melbourne Ward, who described some of the wonders of the life of the Great Barrier Reef in a lecture in Washington.

The fish is known locally as the walking fish, Mr. Ward said. It belongs to the goby family, and like gobies the world over it prefers the very shallow waters of the tide pools to the greater depths that most fishes find necessary for comfort. Like other gobies, it is able to use its lower fins as legs, getting about with almost reptilian agility.

Only it carries its preferences for a shallow-water habitat to the point of remaining at least half out of the water all the time. It sticks its head above the surface, or even lies entirely out of the water, on the mud among the mangrove bushes.

If alarmed, it flees at a surprising speed. But instead of plunging at once into the depths, it skitters along the surface for a long distance, apparently disliking to get itself wet.

The Great Barrier Reef is a vast mass of coral stretching in a line off the eastern coast of Australia. It emerges above the surface as little islands which serve as breeding places for countless flocks of birds, and lately as points of vantage for human visitors who wish to study the amazing array of life with which the whole place swarms. A few years ago the reef was an unknown land, but it is now being scientifically explored and its plants and animals carefully catalogued. Australian scientists and teachers go there in increasing numbers, and foreign visitors, especially Americans, are being encouraged.

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IN SCIENCE

NATURE STUDY

Arachne Provides Lovelier Festoons for Christmas Tree

See Front Cover

CHRISTMAS trees, with their exotic and ephemeral flowing of tinsel and bright paper, are apt to arouse in moralizing adults sentiments of vague regret that all this splendor is for a few hours only. Children, fortunately, are spared such thoughts: for them the hours of Christmas are long and glorious.

But even the tinsel and bright paper are solid and enduring compared with festoons that the Christmas tree may have worn when the year was younger. The cover picture of this issue of the SCIENCE NEWS LETTER shows superbly the bright but brief glory that belonged to a few twigs of one little tree, through the conspiracy of Arachne and Aurora. It is only a spiderweb beaded with big drops of dew, which the first half-hour of sun dispersed; but while it lasted the tree wore a snare of silver threaded with pearls.

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CHEMISTRY

Light Accelerates Spoiling of Fats

A CAREFUL study of the chemistry of the spoilage of fats by C. H. Lea, of the Low Temperature Station, Cambridge, England, has revealed the fact that light plays an important part in its development.

Mr. Lea found that under ordinary conditions fresh beef kidney fat keeps well for a certain initial period, and then quickly becomes rancid. When the fat is kept in darkness, there is a longer initial safe period before it begins to spoil.

Bright light has the opposite effect. If the fat is exposed to direct sunlight on a hot day, rancidity sets in very rapidly, and the initial safe period may be almost completely eliminated. If the fat is placed in sunlight long enough for spoilage to start, even subsequent removal to a dark place will not improve matters very much.

Science News Letter, December 20, 1930

ENCE FIELDS

RECREATION

National Beaches Advocated For Recreation and Science

A SERIES of national beaches, analogous to the national parks, was advocated by J. Spencer Smith, president of the American Shore and Beach Preservation Association, in an address before its annual meeting at the National Research Council in Washington last week.

The association exists for the study of the opportunities presented by the shore and beach lines of America, and for the recommendation of means of solving the problems to be faced in preserving suitable beach areas for public recreation and scientific study.

Mr. Smith advocated the acquisition of such areas by local interests and their assignment to the Federal government for administration and development.

Science News Letter, December 20, 1930

BACTERIOLOGY

Dish Invention Speeds Lock Jaw Diagnosis

A SIMPLE glass dish, the use of which will facilitate and speed up diagnoses of cases of persons suffering from lock jaw or gas gangrene, such as were common during the World War, has been developed by Dr. Robb S. Spray, professor of bacteriology of West Virginia University. The dish is described in detail in the current number of the *Journal of Laboratory and Clinical Medicine*.

The new dish may be "caviar to the general" but it is just the dish for the anaerobe. The anaerobe is a particular sort of bacteria which is not a lover of the great outdoors at all and will live only in a place devoid of oxygen, as in a deep cut or inside the body. To grow these anaerobes in a laboratory in order to isolate them, examine them, and use them in preparation of antitoxins means that they must be housed in an oxygenless container.

Dr. Spray has devised a glass dish with a ridge in the bottom of it. In the two recesses formed by the ridge he places an alkali and an acid which in

combining absorb oxygen. The ridge keeps the solutions apart until the anaerobes are placed on the inside of the lid which is then sealed on the dish. Then by shaking the vessel the solutions mix, absorbing the oxygen in the container.

Heretofore expensive apparatus including huge jars with electric heating coils, vacuum pumps and other devices requiring hours to manipulate were used. The huge jars hindered the examination of the cultures, while with Dr. Spray's dish, about the size of a large, flat measuring cup, the cultures can be readily examined or photographed.

Cultivation of this type of bacteria is a routine procedure in hospital and commercial laboratories. The organisms are isolated in pure cultures for diagnosis of diseases in order that the proper antitoxin may be administered early.

Science News Letter, December 20, 1930

PSYCHOLOGY

Picture of Perfect Nurse Revealed By Doctors

THE nurse the doctor wants for his patients must have good breeding and an attractive personality and know how to handle people, besides being competent in her strictly professional duties.

The doctor's idea of what a nurse should be is revealed by a questionnaire answered by more than 4,000 physicians in all parts of the country for the Committee on the Grading of Nursing Schools.

Skill in making patients comfortable and in general care tied for first place in the list of virtues set down for nurses by the medical vote.

Next in esteem were skill in observing and reporting symptoms, care in following medical orders, good breeding and attractive personality, and skill in handling people.

Specialists dealing with nervous cases, doctors handling children's diseases and obstetricians particularly emphasized the importance of good breeding and personality. The nerve specialists were by far the most interested in having for their patients nurses who can handle people.

How well nurses succeed in living up to the doctors' ideal was revealed by the fact that nine out of ten physicians reported that they were getting the nurses they want and would be glad to recommend the nurse employed on their last case to their next patient.

Science News Letter, December 20, 1930

ARCHAEOLOGY

How Shepherds Counted Sheep Shown by Rare Relic

HOW the shepherds of the East kept count of their flocks 3,500 years ago is shown by a relic just received in Philadelphia from Mesopotamia, by the University of Pennsylvania Museum. The ancient relic is among a collection of objects recently discovered by the archaeological expedition from the Harvard-Baghdad School and the University of Pennsylvania Museum.

The sheep-counter is a hollow clay cylinder containing 49 pebbles. A long cuneiform inscription on the cylinder tells that it belonged to a shepherd named Zakaru and that the pebbles represented 49 sheep entrusted to his care. By preserving a proper balance between the size of his flock and the pebbles in the cylinder Zakaru could render an accounting of his flock at any time.

The collection of objects received at the Museum is from northern Mesopotamia where the expedition has spent three years excavating a deserted mound. This site was once the city of Nuzi, a community noted for its art and its trade.

Science News Letter, December 20, 1930

PUBLIC HEALTH

High Cost of Rabbits Astounds Congress

CONGRESSMEN who remember their boyhood days when they used to catch wild rabbits and sell them for fifteen cents apiece are staggered at the cost of pedigreed white rabbits needed for public health investigations.

Dr. L. R. Thompson of the U. S. Public Health Service told members of the House Appropriations Committee that approximately \$17,278.00 will be needed for purchasing laboratory animals for the National Institute of Health in 1931.

Wild rabbits cannot be used, he told the committee, because they are apt to have many different intestinal parasites, as well as tularemia (rabbit disease).

Guinea pigs for laboratory purposes cost around 90 cents apiece; rabbits, \$1.35; white mice, 17 cents; monkeys, \$16.00; chickens, \$1.85; pigeons, 35 cents; white rats, 50 cents; frogs, 11 cents; and cats, 50 cents.

The establishment of an animal farm where the Health Service can raise its own animals was suggested.

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HORTICULTURE—INVENTION

The Plant Breeder Becomes an Inventor

By DR. JOSEPH ROSSMAN

CONGRESS has passed unanimously a law which gives the man who produces new plants the same encouragement and protection that the inventor of new mechanical or electrical apparatus has received for more than a century.

New plants can now be patented. For seventeen years the breeder of a new plant will have a monopoly on its production. He can grow and sell all of the new variety himself or allow others to raise and sell the new plants while he collects royalties, just as is customary with holders of patents on new radio devices or improvements to steam engines.

There is something new under the sun. As far as it is known this is the world's first plant patent law. Some other countries have a system of plant registration, but it does not confer full privileges of patent like the new law.

Now that plant breeders are assured a fair share of the profits of their creations, they will doubtless become more eager to produce new varieties, and more men will take up this work. Greater activity in this field will certainly result in more beautiful flowers, tastier and more lasting fruit, and plants of all kinds that will not fall before the onslaught of disease.

It is the plant breeder's work to create new and plentiful sources of food supply which can be easily and abundantly reproduced and to develop new medicinal plants to fight disease and lessen human suffering. The North needs a more hardy apple. Seedless fruits of all kinds are in great demand. A substitute for the rubber plant will make the United States free of importing this essential commodity from other countries, and make any plant breeder rich.

The white pine blister rust, the chestnut blight and the phoney peach disease cost the country millions every year. The plant breeder has a golden opportunity to develop new varieties which will stand up against these plagues.

But these changes will not come immediately. It will require many years for the combination of numbers of new plants and improvements in plants to take effect. To perfect just one new plant so that it can be put on the market often requires from 10 to 15 years. Luther Burbank, who while he lived sought the right to patent plants but died before his dream became a reality, devoted more than 19 years to perfecting his amaryllis and over 20 years to developing a new hybrid lily.

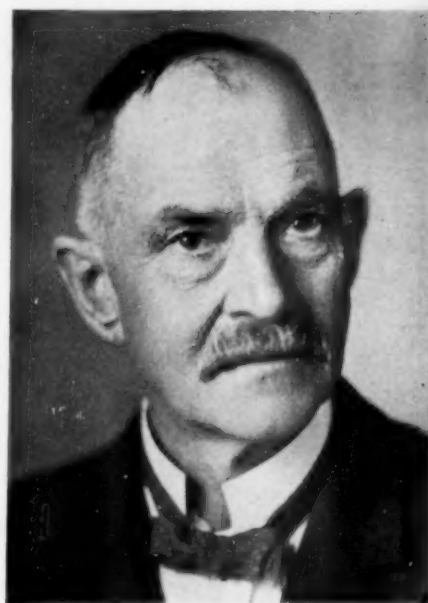
Already horticulturists have submitted applications covering plants which they claim are new and patentable, but the law is so young that full procedure for handling plant patents has not been worked out. The old legal rules and regulations that apply to chemical and mechanical patents will apply to plant patents.

Plants reproduced from seed and those propagated by tubers cannot be patented. Although this limitation applies to a large part of the plant breeder's field, it was made necessary by both commercial and technical reasons. For example, potatoes which are tuber-propagated and wheat which is raised from seed are both great food and seed crops. It is natural and usual for the farmer or gardener who buys potatoes for food to save a few and plant them in his garden. Should he do this with a patented variety and then sell some of his crop, he would be violating the patent.

Hard To Tell Apart

The technical reason is that it is very difficult to tell apart the different varieties of tuber and seed propagated plants. It was to make the law more workable, both for the grower and the consumer who must live under the law and for the scientists who must draw hairline distinctions, that these exclusions were specified.

The class of plants that can be patented, even though limited, offers horticulturists a wide field in which to work. It includes practically all new varieties of fruit and nut trees, such as



DR. WALTER VAN FLEET

The lack of a plant patent law such as the one which has recently gone into effect did not keep him from making twenty-four contributions to rose culture, one of which bears his name, and from introducing important new varieties of other flowers and vegetables.

apples, cherries, oranges, pecans and walnuts; and many small fruits like strawberries, raspberries and grapes; and ornamental shrubs and vines similar to lilacs, roses, wisteria and peonies.

These are plants which can be asexually reproduced. They can give origin to young plants without the sex action of pollination. The law gives the person who invents or discovers a new and distinct variety of plant the exclusive right to propagate that plant by asexual reproduction. It is possible to do this by grafting, cutting, budding, layering, division and like means; but not by seeds.

Even though others try to reproduce his new plant from its seeds, they will not be successful, for the offspring will immediately degenerate and become like the unimproved parent plants.

A plant breeder can develop a new plant in one of three ways. He may notice in a field of the same kind of plants that one plant, or perhaps just a part of it, has suddenly taken on a new appearance which makes it distinctly different from those around it. Such a sudden change is called a bud sport. To save this freak of nature before it is lost and to make it useful to mankind it must be propagated by grafting, budding, cutting, layering, division or a similar method. If it successfully

reproduces, a new plant has been born and the man who found it and nursed it along can have it patented.

If a new variety suddenly appears among seedlings, it too can be propagated asexually and patented. This new plant is called a mutant.

But most plants come from hybridization or the cross-pollination of different kinds of seedlings. The plant breeder artificially fertilizes one variety with the pollen from another to get a new plant. As in the first two cases, to preserve the character of the new individual, it must be reproduced asexually.

The successful hybrid thus obtained can be reproduced in no other way than by one of the asexual methods. If its seeds are planted, all the desirable qualities found in the parent will divide up among the offspring with the mathematical accuracy predicted in Mendel's laws. Most plant patents of the future will probably be granted in this field because the breeding of hybrids can be readily and scientifically controlled.

Thomas A. Edison, who after an exceptional life of mechanical inventing is now launching into the field of "plant inventing" with his experiments with a goldenrod that will produce rubber, endorses plant patents. He says:

Edison's Endorsement

"Nothing that Congress could do to help farming would be of greater value and permanence than to give the plant breeder the same status as the mechanical and chemical inventors now have through the patent law. There are but few plant breeders. This will, I feel sure, give us many Burbanks."

To the name of Burbank, Edison might have added those of scores of other plant breeders, some of whom did work easily comparable with if not greater than that of Burbank. Among them, Dr. Walter Van-Fleet is outstanding. Dr. Van Fleet is best known for his 24 contributions to rose culture, one of which bears his name, but he also introduced important new varieties of peppers, sugar corn, tomatoes, gooseberries, strawberries, canna and gladioli.

Then there is Paul Stark, who had to protect his Delicious apple tree in an iron cage so that shoots for grafting would not be stolen. The famous Peter Henderson; E. G. Hill, the rose grower. Thomas Meehan, who brought out new varieties of grapes; and John Dreer, best known for his work with ornamentals; these are others to whom a successful plant patent law would have been an advantage.

Many difficult problems that are now unknown are expected to arise in the administration of the new law, as the case has been in the applications of the old laws governing mechanical inventions and chemical formulas. For one thing, it has always been possible to describe very exactly the parts and arrangement of a machine, or the ingredients and methods of compounding a formula. But no plant can be described in anything like that rigorous mechanical fashion.

And if the breeder says he got his new "invention" by hybridizing Species A with Species B, that does not mean that anybody else could get it by repeating the same process. He couldn't do it again himself, for hybrids never turn out exactly alike. All the hopeful patentee can do is to give as exact a description as he can write, make drawings, possibly supply samples, and let the horticulturists and the Commissioner of Patents decide.

In the language of the law, patents will be granted only to those who have "invented or discovered and asexually reproduced any distinct and new variety of plant." The new variety does not necessarily have to be a new species but it must have characteristics clearly distinguishable from those of existing varieties.

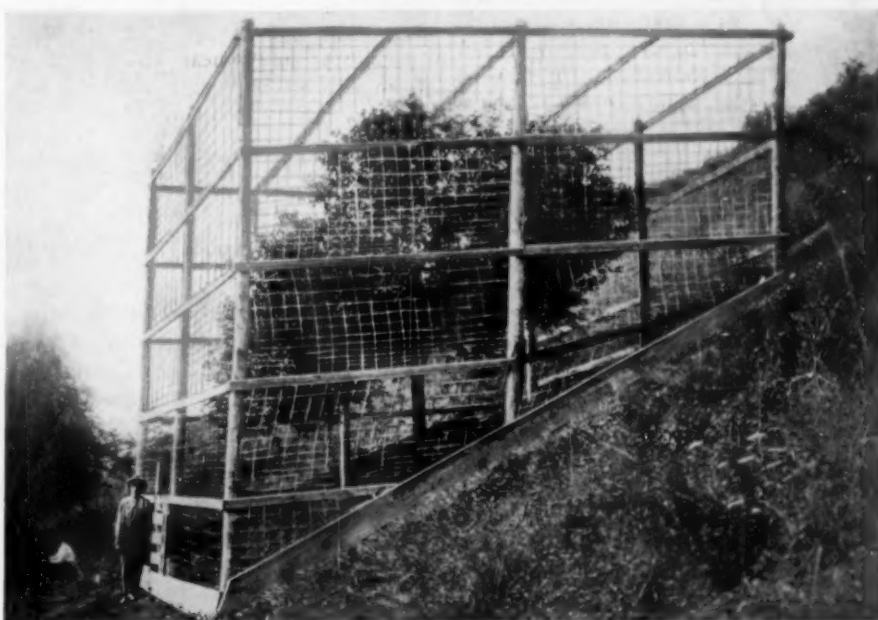
How is a plant "inventor" to describe his new product? Scientists have a pretty good vocabulary for giving the

shape of a fruit or a flower and can do fairly well with colors by reference to standard color charts. But the value of many flowers and fruits depends on odors and aromas, and there is no vocabulary whatever for the description of odors. Just try to write down what a violet smells like, or a Jonathan apple tastes like, and you will see for yourself what the originator of an exquisite and expensive new odor will be up against. In order to make their descriptions clearer, some of the first applications are expected to contain pictures of plants done in water colors.

Another difficulty will lie in the tendency of the original model, itself, to vary. A machine, once made, stays put; it cannot grow or change. But nobody knows whether a Baldwin apple is like the original Baldwins that grew on the first tree of that variety when it was discovered in 1793. The original Baldwin tree is long since dead, and although its thousands of descendants have been faithfully graft-propagated, they have varied a good deal among themselves, and nobody knows which grandson is most like the grandsire.

Suppose you produce a new variety of strawberry, get it patented, and then find it changing into something else before your eyes. Is your patent still good or do you have to take out another one? You wouldn't have to face that question if it were a machine.

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THIS CAGE SUBSTITUTED FOR A PATENT

On one of the Stark Brothers' original Delicious apple trees. It prevented unscrupulous plant breeders and nurserymen from stealing shoots for grafting.

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PHYSIOLOGY

Vitamin D Found to Hasten Formation of Blood Clot

A NEW use for the rickets-preventing, bone-building vitamin D is being investigated in medical fields. Shortening of the time required for blood to clot, vitally important in operations, by the feeding of vitamin D (or ergosterol irradiated with ultraviolet light), is the result which W. C. Corson, G. F. Irwin and I. A. Phillips of the Washington University School of Medicine, St. Louis, recently reported as a result of tests made on white rats.

The formation of a clotted mass of blood is nature's way of stopping the flow of blood through an open wound. Without some such means, most of us would have bled to death long ago. The average normal time required for the formation of this clot is 2 minutes, 10 seconds. It is this length of time which the medical profession wish to see shortened, for to some patients, two minutes of blood flowing freely might be most disastrous.

Normal blood contains in each thimble full about 600,000 bodies known as thrombocytes. These thrombocytes are the points or foci where coagulation of the blood begins whenever the blood leaves the small blood vessels and comes in contact with something different. By increasing the thrombocytes, it then would be possible for the blood more quickly to form this clot which will stop bleeding. The sooner the blood issuing from the open wound thickens and stops flowing, the less blood the patient loses. These three scientists made interesting findings along this very line.

"Each animal receiving vitamin D (as ergosterol irradiated with ultraviolet light) showed a marked decrease in the coagulation time which occurred simultaneously with the marked increase in the thrombocyte count," they say. "The thrombocyte count was doubled in 48 hours. The highest counts recorded, which were as high as 3,000,000 from a normal count of 600,000, were obtained on the fifth through the seventh day after the initial dosage. The lowest coagulation time (15 seconds to 30 seconds) occurred also on the fifth through the seventh day."

"Bleeders" are people whose blood does not coagulate or clot readily. To them this new phase of the use of vita-

min D may be of untold value. Again, certain diseases have such an effect upon the blood. In jaundice, for example, the effect of the disease is in some way to cut down the power of the blood to clot when bleeding occurs.

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BOTANY

Christmas Trees Are Of Many Varieties

THERE are many Christmas trees. By far the heaviest favorite is the spruce. Several different species that look pretty much alike to the layman are found; and they are alike for Christmas-tree purposes. They have short, stiff, prickly needles, pretty completely covering their twigs.

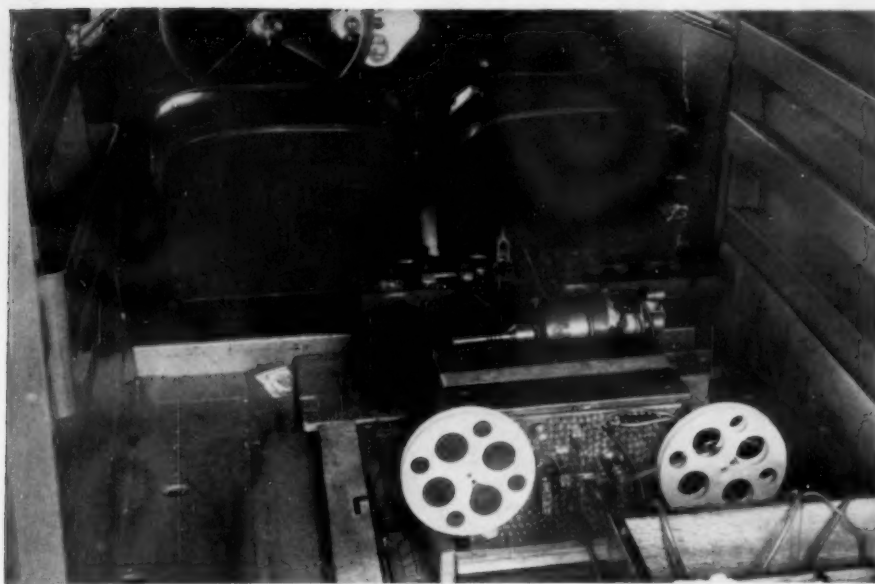
Another kind of tree that is a favorite on the Christmas market when there is a supply is the fir. This looks a good deal like the spruce, but its needles are curved and softer than spruce needles, and are not prickly to handle. When it has cones, they stand up like thick candles, whereas spruce cones are smaller and hang down. Firs often have drops of sticky resin on them, which gives them the alternate name of "balsam."

Where spruces and firs are not abundant, notably in the South, little pines are used a good deal. Several species of pines grow in the poor soils of the barrens and on rocky ledges, and especially in the lowlands where spruce and fir do not venture in the South.

Even more of a favorite than the pines, in the non-spruce areas, is the red cedar or Virginia juniper. This has the advantage of being more compact and symmetrical than a young pine tree, its twigs are also better clothed with their short green needles, giving a more uniformly green appearance.

Almost all other species of evergreens also have their users, and occasionally in the South or in California one even sees little palm trees drafted. But where people can get it, the spruce tree, the original "Tannenbaum" of the old German celebrations, remains the favorite.

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EQUIPMENT IN TEST CAR

When a clapper was sounded and when brakes were put on, marks were automatically made on tape traveling at a uniform speed. The distance between these marks measured the time required to put on the brakes more accurately than any stop watch.

PSYCHOLOGY—HIGHWAY SAFETY

Bureau of Standards Measures Time Taken to Put on Brakes

THE automobile of the future may have new equipment for accelerating, and the term "step on the gas," may be relegated to the dusty archives of forgotten slang, if automobile manufacturers revise their designs as a result of investigations just made by H. H. Allen of the United States Bureau of Standards in Washington.

At the request of another department of the Government, the Bureau of Standards has been conducting experiments under the direction of Mr. Allen with a view to cutting down the time required by drivers to react to a stop signal and put on the brakes.

How long does it take you to take your foot off the accelerator and put on the brake? If you are as quick as the average of drivers recently tested at the United States Bureau of Standards here, it will take you about four-tenths of a second.

That may seem to you too short a time, out of the daily 24 hours, to be worth measuring, but the figure becomes more important when expressed in the distance your car can travel in that length of time. For a car going at 40 miles per hour can travel about 24 feet in four-tenths of a second. The

slowest individual required three-quarters of a second to apply the brakes; his car went 45 feet.

In the case of an emergency when it is essential to put on brakes in the shortest possible time, a driver often has much less than 45 feet between himself and disaster.

Tests were first made by the experts at the Bureau to measure the length of time required to apply brakes with the standard equipment of accelerator and foot brake. Then they made another series of tests in which the driver used a hand control throttle with the foot resting on the brake pedal. In this case the driver, when he received the signal to stop, had only to press down his foot, for it was already in position over the brake pedal.

A marked reduction in time was noted, and the improvement was greatest where it was the most needed; the slowest driver cut down his time the most. The fastest driver required only fourteen-hundredths of a second; the slowest 48-hundredths. The average improvement was about 40 per cent.

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METEOROLOGY

Winter Begins Monday With Shortest Day

NEXT Monday, December 22, at 8:40 a. m., eastern standard time, winter will officially commence. At that moment the Sun, in its southward journey through the sky, will reach the Tropic of Capricorn in the sky, and will then start northwards again.

Because the Sun is so far south, it rises for people in northern countries late in the morning and sets early in the evening. Thus December 22 will be, for Americans, the year's shortest day. The Sun will rise, in latitude 40 degrees north, at 7:18 and will set at 4:38, so it will be above the horizon for only nine hours and twenty minutes. Just six months ago, on June 22, at the beginning of summer, the Sun was in the sky for 15 hours and one minute.

The winter solstice, astronomers term the celestial event that ushers in winter, marks the beginning of summer for people in the temperate regions of the southern hemisphere. In the Antarctic regions any stray explorers will now be enjoying the midnight Sun, with 24 full hours of daylight.

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SURGERY

Surgery Promises Cure For Tropical Elephantiasis

ELEPHANTIASIS, the grotesquely disfiguring tropical disease, may yield to surgical treatment, it appears from investigations of Dr. F. W. O'Connor and colleagues at Columbia University College of Physicians and Surgeons and the Presbyterian Hospital in New York.

Filariasis is the scientific name for this tropical disease which so often causes disfigurement and disability by enormous enlargement of the limbs, from which it gets the popular name of elephantiasis.

The disease is caused by a worm called filaria. The larvae of this worm make their way into the body of man from the proboscis of certain mosquitoes at the time of sucking blood. Once in the body, they multiply and periodically produce embryos, the so-called microfilariae.

The worms may ultimately become so numerous and accumulate in such large numbers in one place that the circulation of lymph may be interfered with. The limbs and other parts of the body increase, in consequence, to enormous size.

Dr. O'Connor elicited from his patients the fact that there was often a small area where the pain was most intense. On removing tissue from such focal spots he found the worms in the

tissue. Later he found that the accumulations of worms could be located more exactly by X-ray photographs.

Surgical removal of the tissue containing the worms has resulted in disappearance of symptoms of filariasis in several cases in which the method has been tried.

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ARCHAEOLOGY

Writings 2,000 Years Old Found By Asian Expedition

A NUMBER of important scripts dating back to the first Han dynasty, 206 B. C. to A. D. 25, have been found near Edsin Gol, the site of an old city mentioned by Marco Polo in his travels. The writings were discovered by Dr. Folke Bergman, archaeologist of the expedition directed by Dr. Sven Hedin, noted Swedish explorer.

Inscribed on wooden strips before the invention of paper, these writings deal mainly with the military campaigns of the early Han emperors in defending their empire against the invading Huns. The newly found writing are believed to be much older than anything of the kind previously known, and are expected to shed much light upon an historical period now very obscure.

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ORNITHOLOGY

Nature Ramblings

By FRANK THONE



Remember the Birds

WHEN you are preparing for your Christmas feast, remember also the birds. If there is enough snow to make you rejoice in an "old-fashioned Christmas," it will mean a harder Christmas for the birds, a great deal of whose living in winter depends on access to the ground. Therefore spare them the crumbs that fall from your table, which is really all that is required by these brothers of the adoption of St. Francis.

It is better not to scatter your alms for the birds on the ground. If there is snow, that makes the food less wholesome, and much of it is lost. And in any case, it exposes the little feasters to the onfall of cats, who know nothing of peace on earth at any season, nor aught of goodwill toward their fellow-creatures. Rig a flat box, preferably with a shelter from wind and snow, on top of a post. Or better even than that, hang it in the middle of a stretched wire, where it will be safe from pilfering squirrels as well as from murdering cats. And forget not a lump of suet, securely nailed or tied. Birds rejoice in suet as Christmas feasters do in a roast goose or a plum pudding.

We are promised a high reward if we remember the least of the brethren with a cup of cold water. Let us, however, extend our charity toward the little feathered ones just a little further. Warm the water, so that it may stand outdoors the longer before it freezes. And do not set it out in the same pan you have warmed it in: the hot rim may burn the birds' feet. Better attend to this gift of water twice a day if the weather is so cold as to freeze up other drinking places. Thirst is often a worse distress than hunger when the world is locked up in ice.

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page 400

Biology

STUDIES IN THE LITERATURE OF NATURAL SCIENCE—Julian M. Drachman—*Macmillan*, 487 p., \$4. A new and interesting approach to the history of science. The dramatic rise of biological theory is treated like other literature, as the expression of its authors' minds. References, bibliography and index are excellent.

Science News Letter, December 20, 1930

Eugenics

PRACTICAL APPLICATIONS OF HEREDITY—Paul Popenoe—*Williams and Wilkins*, 128 p., \$1. An interesting group of popular essays with such engaging titles as *Will Your Son Be A Genius?* *Heredity and the Infant Prodigy*, *Your Children's Chance To Be Talented*. The book should win many friends to the cause of eugenics because of the simple, effective way in which the practical side of this science is presented.

Science News Letter, December 20, 1930

General Science

FIVE YEARS OF RESEARCH IN INDUSTRY 1926-1930—Clarence J. West—*National Research Council*, 91 p. 50c. Those who wish to obtain a background of recent industrial and scientific research in more than eighty fields of industry ranging from abrasives to woods will find this bibliography helpful in selecting articles which are worthy of being read.

Science News Letter, December 20, 1930

Natural History—Travel

GUIDE TO THE CRATERS OF THE MOON NATIONAL MONUMENT, IDAHO—Harold T. Stearns—*Caxton Printers, Caldwell, Idaho*, 59 p., pa. 25c, lea. \$2. A compact and well-illustrated guide to one of the newest and most interesting of our national monuments. The principal attention is given to the volcanic geology of the region, but there are also brief sections on the plant and animal life.

Science News Letter, December 20, 1930

Physics

THE WAVE MECHANICS OF FREE ELECTRONS—G. P. Thomson—*McGraw-Hill*, 172 p., \$2.50.—The wave mechanics of de Broglie and Schrödinger has been one of the most important physical developments of recent years, and Dr. Thomson, son of Sir J. J. Thomson, discoverer of the electron, has been in the forefront of those studying the

problem. In this volume are published the lectures he gave on the subject last year at Cornell University. It is an attempt, says the preface, "to state the principles and application of the new wave mechanics, in so far as these concern electrons not forming part of an atom, using the minimum of mathematics." In this attempt he has succeeded admirably, and the book can be recommended to anyone who wants authoritative information concerning this new phase of physical science.

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Physics

MATTER AND ENERGY, VOL. I.—Gerald Wendt and Oscar F. Smith—*Blakiston*, 335 p., \$1.50. For some years students at Pennsylvania State College have been given an introductory course combining physics and chemistry, making no distinction between them, but using both to give the student an idea of the fundamental nature of matter and energy. This first volume is an inquiry into the nature of matter and energy, and covers such topics as molecules, atoms, protons, electrons and radiation. The second volume, it is announced, will show how modern civilization rests on this knowledge.

Science News Letter, December 20, 1930

General Science

PATENT RIGHTS FOR SCIENTIFIC DISCOVERY—C. J. Hamson—*Bobbs-Merrill*, 286 p., \$5. Though the composer of a sonata can copyright his work, and control its presentation; and the inventor of a mousetrap can patent it and share in the profits, if any; the discoverer of a fundamental scientific principle has no such rights. His discovery becomes public property. In this book the author sums up the situation in various countries and suggests a statute that would give such rights to the scientist. It is doubtful, however, whether many scientific men would care to take advantage of such rights, and it seems highly probable that any such procedure would materially retard the progress of science.

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Plant Pathology

EPIDEMIC DISEASES OF FRUIT TREES IN ILLINOIS 1922-1928—L. R. Tehon and G. L. Stout, 97 p. Of interest to plant pathologists and commercial orchardists.

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Chemistry

AN INTRODUCTION TO CHEMISTRY—John Arrrend Timm—*McGraw-Hill*, 561 p., \$3.50. It is a bit surprising to one brought up on the older generation of chemical textbooks to find one that contains discussions of such topics as sound waves, radiation of electromagnetic waves including x-rays, the quantum theory and Millikan's oil drop experiment to determine the charge of the electron, as in this excellent work. However, the subtitle, "A Pandemic Text," should prepare the reader for an unorthodox presentation. The idea of the book, and the course at Yale on which it is based, is to give the student who takes only chemistry a good idea of the problems of physical science, and it seems that it should be successful in this attempt.

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Biography—General Science

THE BOOK OF MY LIFE—Jerome Cardan, translated by Jean Stoner—*Dutton*, 331 p., \$3.50. An unusual autobiography is here made available to English readers. Dr. Cardan was a celebrated Italian physician, a contemporary of Cellini. His life was an exciting one and he writes of it in pleasing style. Besides being an eminent scientist, he was a believer in magic. This translation is equipped with an introduction and explanatory notes.

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Archaeology

EXPLORATION OF RUINS IN THE WHITE MOUNTAIN APACHE INDIAN RESERVATION, ARIZONA—Walter Hough—*Smithsonian Institution*, 20 p., 10 pl. At this pueblo, explorations were conducted in 1919 for the Bureau of American Ethnology. Detailed results have not heretofore been published. Dr. Hough explains, because it was expected that further work might be done there. Some interesting features of pueblo engineering were found at this site.

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Ichthyology

CONTRIBUTION TO THE BIOLOGY OF THE PACIFIC HERRING, "CLUPEA PALASII, AND THE CONDITION OF THE FISHERY IN ALASKA—G. A. Rounsefell—*Government Printing Office*, 93 p., 35 c. A publication of the Bureau of Fisheries, of interest to ichthyologists and commercial fishermen.

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• First Glances at New Books

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Public Health History

RIDERS OF THE PLAGUES—James A. Tobey—*Scribner's*, 348 p., \$3.50. A vivid, dramatic account of some of the world's worst plagues and man's conquest of them. Unfortunately, the modern reader may be discouraged by the long paragraphs and rather long sentences. The book has several fine illustrations and the frontispiece and title page are particularly attractive.

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Physics

A TEXTBOOK OF SOUND—A. B. Wood—*Macmillan*, 519 p., \$6.50. Authors of older books on sound would hardly recognize some of the topics covered in this excellent work, as belonging in their field. "For want of a more appropriate word," says the author, "I have regarded 'sound' as referring to vibrations of all frequencies, audible or otherwise." Hence we find mentioned such topics as sonic depth finding, sound ranging, and the work with ultra-sonics of R. W. Wood and A. L. Loomis at the latter's Laboratory at Tuxedo Park. In addition are the more usual topics, dealing with audible sound, including vibrations of a string, of bars and of membranes, transmissions of sound, etc.

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Natural History

ABYSSINIAN BIRDS AND MAMMALS—Louis Agassiz Fuentès—*Field Museum*, 32 colored prints, portfolio \$3, fabrikoid bound \$5. Once in a rare while a publication appears which makes ordinarily reluctant reviewers perfectly willing to indulge in superlatives. This collection of prints of paintings made in Africa by the late Louis Agassiz Fuentès demonstrates anew that he was king of his craft and makes us realize with a fresh pang what the worlds of zoology and art alike lost by his untimely death. The printers have done their work so well that one could easily believe he had a collection of Fuentès' originals in his hand instead of "just prints."

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Medical History

HISTORIC ARTIFICIAL LIMBS—Vittorio Putti—*Hoebner*, 63 p., \$1.50. Translated by Dr. M. Forrester Brown. A short discussion of an unusual but interesting subject. The author, professor of orthopedic surgery at the famous University of Bologna, is particularly well qualified to discuss it. Eight arti-

ficial limbs are illustrated and described in detail with the author's opinions. Several others are mentioned more briefly in the introduction. The book will interest historians as well as orthopedic surgeons, and also those who have made a hobby of armor and old inventions.

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Travel

GREAT DIPPER TO SOUTHERN CROSS—Edward H. Dodd, Jr.—*Dodd, Mead*, 332 p., \$3.50. An interesting account of the voyage of five Yale men, including the author, in a seventy-five-foot schooner from Connecticut to Australia.

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General Science

SCIENCE AND THE SCIENTIFIC MIND—Leo E. Savidla and Warren E. Gibbs—*McGraw-Hill*, 506 p. \$3. Essays on various inspirational aspects of science are here gathered for use in English or general science courses in which it is desired to emphasize the scientific habit of thought. The work of modern essayists, including Edwin E. Slosson, Robert Andrews Millikan, Bertrand Russell, Michael Pupin and others is mingled with that of another generation represented by John Tyndall and Thomas Henry Huxley.

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Sociology—Philanthropy

ANNUAL REPORT FOR 1929—*Rockefeller Foundation*, 401 p., Free. This covers the first year of the reorganized Foundation under the guidance of its new president, Dr. Max Mason. Several new policies are described. The bulk of the report covers the activities of the International Health Division.

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Chemistry—Botany

PLANT PHYSIOLOGICAL CHEMISTRY—Rodney Beecher Harvey—*Century*, 413 p., \$6. As its title implies, this reference and textbook is written from a physiological rather than a chemical point of view. It is a comprehensive presentation of the chemical mechanism of plants.

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Zoology

THE SALAMANDERS OF THE CHICAGO AREA—K. P. Schmidt—*Field Museum*, 16 p., 4 pl. Another of the useful booklets of the Field Museum series.

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Physics

PHOTOCELLS AND THEIR APPLICATION—V. K. Zworykin and E. D. Wilson—*Wiley*, 209 p., \$2.50. So important has the photoelectric cell become in modern science and industry, that it is about time for an adequate book dealing with its theory and applications. Dr. Zworykin and his colleague, both Westinghouse research engineers, have themselves made important contributions to these applications, so the book is entirely authoritative. First, the history of the cell is given, then its theory and mechanical features. The later chapters tell of its application in sound movies, facsimile transmission, television, and such other applications as counting, photometry, color matching, etc. The final chapter discusses "Photocells in the Future." It is a book to be highly recommended to any who want complete information on this valuable device.

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Archaeology

THE ARCHAEOLOGY OF THE WHITEWATER VALLEY—Frank M. Setzler—*Historical Bureau, Indiana Library and Historical Dept., Indianapolis*, 188 p. Indiana is one of the midwestern states to undertake the task of surveying Indian remains within its borders. The survey of the Whitewater Valley is completed after two seasons of work, and the *Indiana Historical Bulletin* has given over its September, 1930, issue to it.

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Mechanics

MECHANICS—James E. Boyd—*McGraw-Hill*, 384 p., \$3.50. Here is the second edition of a widely used college text. The principal change is the adoption of the British engineer's unit of mass, equal to 32.174 pounds mass. For this the author prefers the name "geepound" though he does mention Worthington's suggestion that it be called a "slug."

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Biology

(1) **THE BIOLOGY OF THE VOLES OF NEW YORK** (2) **THE RELATION OF MAMMALS TO THE HARVARD FOREST**—Robert T. Hatt—*Roosevelt Wild Life Forest Experiment Station*, 165 p., \$1. A full discussion of the biology of an interesting group of mammals, with a briefer discussion of the relation of mammals in general to a forested area.

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